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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/624,522	07/24/2000	Rob A. Beuker	PHN 17,569	6297

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EXAMINER
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ART UNIT	PAPER NUMBER
2613	

DATE MAILED: 03/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/624,522	BEUKER, ROB A.	
	Examiner	Art Unit	
	Tung T. Vo	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-8 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-8 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 4-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Horne (US 5,473,379).

Note the applicant discloses or describes the most-used global vector is also used as best global motion vector. Therefore, a most frequently occurring block-based motion vector is interpreted as a best block-based motion vector and a second second-most frequently occurring block-based motion vector is interpreted as a second best block-based motion vector.

Re claim 1, Horne discloses the same motion vector estimation method that comprises the steps:

carrying out a block-based motion vector estimation process (104 of fig. 1) that involves comparing a plurality of candidate vectors to determine block-based motion vectors (302, 310, 312, 314, 316, 318 of fig. 3A; e.g. the step (312) compares the block DBi,t with several candidate displaced blocks to determine the best block-based motion vectors MVi,dt; see also col. 10, line 50 through col. 11, line 26);

determining at least a most frequently occurring block based motion vector (310 and 318 of fig. 3A; e.g. the step (318) determines the best block-based motion vector MVi,dt based upon the best matched block within the search window Aref that is defined by the step (310); see also col. 9, lines 30-35; col. 11, lines 21-24);

carrying out a global motion vector estimation process (106 of fig. 1) using at least the most frequently occurring block-based motion vector to obtain a global motion vector (401, 402, 403, 404, 405, 406, and 407 of fig. 4; e.g. the step (407) determines a global motion vector using the best block-based motion vector MVi,dt that is received from the block-based motion vector estimation process (322 of fig. 3A); see also col. 11, lines 29-32 , and col. 12, lines 29 through col. 13, line 16);

applying the global motion vector as a candidate vector to the block-based motion vector estimation process (330 of fig. 3A; e.g. the step (330) receives the global motion vector from the motion estimator (106 of fig. 1); see also col. 11, lines 47-58).

Re claim 4, Horne further discloses wherein both the most frequently occurring block-based motion vector and a second-most frequently occurring block-based motion vector are determined and used in the global motion vector estimation process (302, 310, 312, 316, 318,

322, 328 of fig. 3A; e.g. the step (318) determines the most frequently occurring block-based motion vector (the best block-based motion vector) in the frame that is transmitted by the step (322) to the global motion estimator (106 of fig. 1); if there are more blocks within the frame as shown in the step (328), a second best block-based motion vector (second-most frequently occurring block-based motion vector) is determined by the step (318) and then being transmitted to the global motion estimator (106 of fig. 1) by the step of (322); see also col. 11, lines 29-31, 47-56).

Re claim 5, Horne further discloses wherein said global motion vector estimation process includes the steps of comparing,

on a block basis (col. 12, lines 12-14; e.g. the global motion estimator (106 of fig. 1) generates a global motion vectors for a video frame by estimating the component of motion common to every block (block basis) in the entire frame, and using block matching with respect to any reference frame),

a plurality of candidate vectors, including the most frequently occurring block-based motion vector, to obtain best vectors determined per block (401 of fig. 4; e.g. the best motion vector MVi,dt is calculated by comparing the DBi,t with candidate displaced blocks, best matched block within Aref, see also col.10, line 56 through col. 11, line 1, 29-31; col. 12, lines 29-32);

and outputting a most-frequently occurring best vector determined per block as the global motion vector (405 of fig. 5; the best motion vector is determined in the step (407) of the global

motion estimator (106 of fig. 1) to output the global motion vector to the motion compression device).

Re claim 6, Horne further discloses A motion vector estimation device, comprising:

block-based motion vector estimation means for determining block-based motion vectors based on a comparison of a plurality of candidate vectors (104 of fig. 1; 302, 310, 312, 314, 316, and 318 of fig. 3A; e.g. the step (312) compares the block DBi,t with several candidate displaced blocks to determine the best block-based motion vectors MVi,dt; see also col. 10, line 50 through col. 11, line 26);

means for determining at least a most frequently occurring block-based motion vector (104 of fig. 1; 310 and 318 of fig. 3A; e.g. the step (318) determines the best bock-based motion vector MVi,dt based upon the best matched block within the search window Aref that is defined by the step (310); see also col. 9, lines 30-35; col. 11, lines 21-24);

means for carrying out a global motion vector estimation process using at least the most frequently occurring block-based motion vector to obtain a global motion vector (106 of fig. 1; 401, 402, 403, 404, 405, 406, and 407 of fig. 4; e.g. the step (407) determines a global motion vector using the best block-based motion vector MVi,dt that is received from the block-based motion vector estimation process (322 of fig. 3A); see also col. 11, lines 29-32 , and col. 12, lines 29 through col. 13, line 16); and

means for applying the global motion vector as a candidate vector to the block-based motion vector estimation means (106 of fig. 1; 330 of fig. 3A; e.g. the step (330) receives the global motion vector from the motion estimator (106 of fig. 1); see also col. 11, lines 47-58).

Re claim 7, Horne further discloses a motion-compensated picture signal processing apparatus, comprising:

a motion vector estimation device for generating motion vectors (104 and 106 of fig. 1); and a motion-compensated processor for processing a picture signal in dependence on the motion vectors (104 and 105 of fig. 1; e.g. the block-based motion estimator (104) further includes motion compensation means considered as a motion-compensated processor for providing displaced block data to the subtraction node (105), see also col. 4, lines 49-55).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horne (US 5,473,379) as applied to claim 1, and further in view of Zhu (US 6,462,791).

Re claims 2 and 3, Horne suggests means for generating an error signal representing the difference in pixel luminance and chrominance between two video data blocks received from the motion estimator (104 of fig. 2), and the means absolute difference used to calculate the difference between the total pixel luminance for the new block and the total pixel luminance value for each candidate displaced block (maximum and minimum values).

Horne does not particularly disclose making a selection among block-based motion vectors having a corresponding motion error below a given motion error threshold; and making a

selection among block-based motion vectors estimated for blocks having a difference between maximum and minimum pixel values above a given activity threshold as claimed.

However, Zhu teaches making a selection among block-based motion vectors having a corresponding motion error below a given motion error threshold (col. 4, lines 65-67; e.g. the absolute difference DA < threshold TA, the motion vector Vi set to the best matched motion vector Abest), and making a selection among block-based motion vectors estimated for blocks having a difference between maximum and minimum pixel values above a given activity threshold (col. 5, lines 15-20; the absolute difference between the maximum pixel value (V1 of fig. 5) and minimum pixel value (V2 of fig. 5) is above the threshold TA, the motion vector set to zero Vi=0).

Therefore, taking combined teachings of Horne and Zhu as a whole, it would have been obvious to one of ordinary skill in the art to implement making the selection among block-based motion vectors of Zhu (col. 4, line 51 through col. 5, line 27) into the motion estimation device (104 and 106 of fig. 1) of Horne for the same purpose of making the selection among block-based motion vectors (best block-based motion vectors) so that the encoder/coder encodes the motion vectors according to those best motion vectors as suggested by Zhu (col. 3, line 65 through col. 4, line 3). Doing so would allow the motion compensation to improve the efficiency of the prediction of pixel values for high compression rates which maintains packet loss resiliency as suggested by Zhu (col. 1, lines 43-45; col. 2, lines 59-63).

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Horne (US 5,473,379) as applied to claims 6 and 7, and further in view of De Haan et al. (US 6,385,245 B1).

Re claim 8, Horne teaches a motion-compensated picture signal processing apparatus comprises the motion estimator (104 and 106 of fig. 1) included motion compensation means (col. 4, lines 53-55) to obtain a processed picture signal, but Horne does not particularly teaches a display device for displaying the processed picture signal as claimed.

However, De Haan teaches a display unit (device) (D of fig. 2) for displaying the output video (processed picture signal) from the median filters MED1 and MED2 of motion compensation (col. 4, lines 6-25). Therefore, taking combined teachings of Horne and De Haan as a whole, it would have been obvious to one of ordinary skill in the art to implement the display unit (device) (D of fig. 2) of De Haan into the motion estimation device (100 of fig. 1) of Horne for the same purpose of displaying the processed picture signal as suggested by De Haan (col. 4, lines 6-25). Doing so would allow the motion estimator to reduce complexity of computation vector and keep the cost of the implementation as low as possible as suggested by De Haan (col. 2, lines 2-5; col. 9, lines 29-33).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

De Haan et al. (US 6,278736) discloses a motion estimation.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tung T. Vo whose telephone number is (703) 308-5874. The examiner can normally be reached on 6:30 AM - 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris. Kelley can be reached on (703) 305-4856. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.

TUNG T. VO
PATENT EXAMINER

T.Vo
March 4, 2003

Tung T. Vo
Examiner
Art Unit 2613